



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/081,767	02/25/2002	Shunpei Yamazaki	740756-2443	9406

22204 7590 03/18/2005

NIXON PEABODY, LLP  
401 9TH STREET, NW  
SUITE 900  
WASHINGTON, DC 20004-2128

EXAMINER

NGUYEN, THANH T

ART UNIT PAPER NUMBER

2813

DATE MAILED: 03/18/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/081,767	<b>Applicant(s)</b> YAMAZAKI ET AL.	
	<b>Examiner</b> Thanh T. Nguyen	<b>Art Unit</b> 2813	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☐ Responsive to communication(s) filed on 27 December 2004.
- 2a) ☒ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 6-8, 17-22, 25 and 49-85 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 6-8, 17-22, 25 and 49-85 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>12/27/04</u> . | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Response to Arguments***

Applicant's arguments filed 12/27/04 have been fully considered but they are not persuasive.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 6-7, 18-21, 25, 49, 51, 54, 57-60, 62, 64, 78-81 are stand rejected under 35 U.S.C. 102(e) as being anticipated by Yamazaki et al. (U.S. Publication No. 2002/0119585) as previously applied.

Referring to figures 2a-4d, Yamazaki et al. teaches a method of manufacturing a semiconductor device, comprising the steps of:

Adding a metal element (Ni, see paragraph# 64, as claimed in claims 25, 64, 76, 81) to an amorphous semiconductor film (12, see paragraph# 63, as claimed in claim 79),

Art Unit: 2813

Irradiating the first crystalline semiconductor film (12, see paragraph# 64,, as claimed in claim 80-81) with a laser light to form a second crystalline semiconductor film having a warp (convex/ridges, see paragraph# 64),

Etching (patterning) the second crystalline semiconductor film (12) to form a crystalline semiconductor island (see figures 4b-4c),

Second heating the crystalline semiconductor island at a higher temperature than the first heating step to lessen the warp (see paragraph# 64-67, 73-75, 87-89, figures 2c-3b)

Regarding to claims 18, 57, 69, lamp light is radiated in the second heating step (see paragraph# 65-66).

Regarding to claims 20, 59, 71, lamp light is radiated from at least one selected form the group consisting of an upper side and lower side of the substrate (see figures 4a-4b).

Regarding to claims 21, 60, 72, lamp light is radiated from halogen lamp (see paragraph# 65-66).

Regarding to claims 49, 54, 66 excimer laser (see paragraph# 64).

Regarding to claims 50, 67, the laser light has a rectangular or linear shape. The shape of the light does not make the device function different therefore it would have been obvious to form the laser light has a rectangular or linear shape as a design choice.

Regarding to claims 51, 62, 74, form the amorphous layer by using the LPCVD (see paragraph# 63).

Regarding to claim 80, semiconductor film is crystallized before the irradiating with laser light (see paragraph#64).

*Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 8, 17, 22, 25, 50, 52-53, 55-56, 61, 63, 65-77, 82-85 are stand rejected under 35 U.S.C. 103(a) as being unpatentable over Yamazaki et al. (U.S. Publication No. 2002/0119585) as applied to claims 6-7, 18-21, 25, 49, 51, 54, 57-60, 62, 64, 78-81 above as previously applied.

Referring to figures 2a-4d, Yamazaki et al. teaches a method of manufacturing a semiconductor device, comprising the steps of:

Adding a metal element (Ni, see paragraph# 64, as claimed in claims 85) to an amorphous semiconductor film (12, see paragraph# 63, as claimed in claim 83),

Irradiating the first crystalline semiconductor film (12, see paragraph# 64,, as claimed in claim 80-81) with a laser light to form a second crystalline semiconductor film having a warp (convex/ridges, see paragraph# 64),

Etching (patterning) the second crystalline semiconductor film (12) to form a crystalline semiconductor island (see figures 4b-4c),

Second heating the crystalline semiconductor island at a higher temperature than the first heating step to lessen the warp (see paragraph# 64-67, 73-75, 87-89).

Art Unit: 2813

It is noted that absent a showing of unexpected result, a change in sequence involves routine optimization of process of prior art and would have been obvious to one skilled in the art at the time the invention was made. A change in sequence/reversal of process steps is obvious under 35 USC 103 (ex parte Rubin, 128 USPQ 440 (Bd. App. 1959)). See also in re Burhans, 154 F.2d 690, 69 USPQ 330 (CCPA).

Regarding to claims 17, 56, 68, annealing furnace is used in the second heating step (see paragraph# 65-66, It is known in the art that heating step is done in the furnace to prevent the contamination).

Regarding to claims 18, 57, 69, lamp light is radiated in the second heating step (see paragraph# 65-66).

Regarding to claims 20, 59, 71, lamp light is radiated from at least one selected form the group consisting of an upper side and lower side of the substrate (see figures 4a-4b).

Regarding to claims 21, 60, 72, lamp light is radiated from halogen lamp (see paragraph# 65-66).

Regarding to claims 49, 54, 66, excimer laser (see paragraph# 64).

Regarding to claims 51, 62, 74, form the amorphous layer by using the LPCVD (see paragraph# 63).

Regarding to claim 84, semiconductor film is crystallized before the irradiating with laser light (see paragraph#64).

However, the reference does not teach the laser light has a rectangular or linear shape, semiconductor device as claimed above to use as display or camera or computer or telephone, the specific temperature range, the time range, the rate of heating.

Art Unit: 2813

Regarding to claims 50, 67, the laser light has a rectangular or linear shape. The shape of the light does not make the device function different therefore it would have been obvious to form the laser light has a rectangular or linear shape as a design choice.

Regarding to claims 53, 55, 77, It is obvious to one of ordinary skill in the requisite art at the time of the invention was made to form a semiconductor device as claimed above to use as display or camera or computer or telephone.

The temperature range, the time range, the rate of heating are considered to involve routine optimization while has been held to be within the level of ordinary skill in the art. As noted in *In re Aller 105 USPQ233*, the selection of reaction parameters such as temperature and concentration would have been obvious:

“Normally, it is to be expected that a change in temperature, or in concentration, or in both, would be an unpatentable modification. Under some circumstances, however, changes such as these may impart patentability to a process if the particular ranges claimed produce a new and unexpected result which is different in kind and not merely degree from the results of the prior art...such ranges are termed “critical ranges and the applicant has the burden of proving such criticality.... More particularly, where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation.”

*In re Aller 105 USPQ233, 255 (CCPA 1955). See also In re Waite 77 USPQ 586 (CCPA 1948); In re Scherl 70 USPQ 204 (CCPA 1946); In re Irmscher 66 USPQ 314 (CCPA 1945); In re Norman 66 USPQ 308 (CCPA 1945); In re Swenson 56 USPQ 372 (CCPA 1942); In re Sola 25 USPQ 433 (CCPA 1935); In re Dreyfus 24 USPQ 52 (CCPA 1934).*

Therefore, one of ordinary skill in the requisite art at the time the invention was made would have used any temperature range, the time range, the rate of heating range suitable to the method in process of Yamazaki et al. in order to optimize the process.

### ***Response to Arguments***

Applicant's arguments filed 12/27/04 have been fully considered but they are not persuasive.

Applicant contends that Yamazaki et al. does not teach or suggest second heating the second crystalline semiconductor film at a higher temperature than the first heating step to lessen the warp. In response to applicant that Yamazaki et al. clearly teaches second heating the second crystalline semiconductor film at a higher temperature than the first heating step to lessen the warp (see paragraph# 64-67, 73-75, 87-89).

Applicant also contends that Yamazaki teaches that an internal stress is relaxed to from ridges and ridges are reduced by heat-process. In response to applicant that the present invention does not exclude that an internal stress is relaxed to from ridges and ridges are reduced by heat-process. Therefore, the rejection still stands.

Regarding to page 4 of the last rejection, there was a typographical error. Please ignore "and 49-85" under 35 U.S.C. 103(a) rejection.

### ***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37

Art Unit: 2813

CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thanh Nguyen whose telephone number is (571) 272-1695, or by Email via address Thanh.Nguyen@uspto.gov. The examiner can normally be reached on Monday-Thursday from 6:00AM to 3:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Whitehead, Jr., can be reached on (571) 272-1702. The fax phone number for this Group is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0956 (See **MPEP 203.08**).



Thanh Nguyen  
Patent Examiner  
Patent Examining Group 2800

TTN